

WHAT IS CLAIMED IS:

1. A multi-color image-forming material comprising image-receiving sheets each having an image-receiving layer and heat transfer sheets for at least four colors, including yellow, magenta, cyan and black, each having at least a light-to-heat conversion layer and an image-forming layer on a support, said heat transfer sheets and said image-receiving sheets being respectively laminated such that the image-forming layer of said heat transfer sheet and the image-receiving layer of said image-receiving sheet are opposed to each other, whereby the irradiation with laser beam causes the area irradiated with laser beam on the image-forming layer to be transferred onto the image-forming layer in the image-receiving sheet to effect image recording, wherein the thickness of the image-forming layer in said heat transfer sheets is from 0.01  $\mu\text{m}$  to 1.5  $\mu\text{m}$  and the width of lines in laser-transferred image is from 0.8 to 2.0 times a half of the half-width (the half width at half maximum) of the distribution in the direction of subsidiary scanning of the integration of the binary energy distribution of laser beam spot in the direction of main scanning.

2. The multi-color image-forming material comprising image-receiving sheets each having an image-receiving layer and heat transfer sheets for at least four colors, including yellow, magenta, cyan and black, each having at least a light-to-heat

conversion layer and an image-forming layer on a support, said heat transfer sheets and said image-receiving sheets being respectively laminated such that the image-forming layer of said heat transfer sheet and the image-receiving layer of said image-receiving sheet are opposed to each other, whereby the irradiation with laser beam causes the area irradiated with laser beam on the image-forming layer to be transferred onto the image-forming layer in the image-receiving sheet to effect image recording, wherein said heat transfer sheets are a yellow heat transfer sheet the maximum absorbance ( $\lambda_{max}$ ) of which in spectral distribution falls within a range of from 380 nm to 460 nm, a magenta heat transfer sheet the maximum absorbance ( $\lambda_{max}$ ) of which in spectral distribution falls within a range of from 540 nm to 600 nm, a cyan heat transfer sheet the maximum absorbance ( $\lambda_{max}$ ) of which in spectral distribution falls within a range of from 610 nm to 730 nm and a black heat transfer sheet.

3. The multi-color image-forming material as in Claim 2, wherein the half-width measured when the maximum absorbance ( $\lambda_{max}$ ) is 1.0 is from 90 nm to 160 nm for said yellow heat transfer sheet, from 40 nm to 130 nm for said magenta heat transfer sheet and from 90 nm to 160 nm for said cyan heat transfer sheet.

4. The multi-color image-forming material as in Claim 1, wherein the change of  $\Delta E$  measured with  $D_{65}$  or A as a light source is not greater than 2.0 for said cyan heat transfer sheet supposing that  $\Delta E$  is the color difference between the color hue ( $L1*a1*b1*$ ) and the desired color hue ( $L2*a2*b2*$ ) of said image-forming layer represented by the following equation:

$$\Delta E = \{(L1* - L2*)^2 + (a1* - a2*)^2 + (b1* - b2*)^2\}^{0.5}$$

5. The multi-color image-forming material as in Claim 4, wherein  $\Delta E$  of said cyan heat transfer sheet is not greater than 15.0.

6. The multi-color image-forming material as in Claim 1, wherein the change width of  $\Delta E$  measured with  $D_{65}$  or A as a light source is not greater than 1.5 for said magenta heat transfer sheet supposing that  $\Delta E$  is the color difference between the color hue ( $L1*a1*b1*$ ) and the desired color hue ( $L2*a2*b2*$ ) of said image-forming layer represented by the following equation:

$$\Delta E = \{(L1* - L2*)^2 + (a1* - a2*)^2 + (b1* - b2*)^2\}^{0.5}$$

7. The multi-color image-forming material as in Claim 6, wherein  $\Delta E$  of said magenta heat transfer sheet is not greater than 16.0.

8. The multi-color image-forming material as in Claim 1, wherein the change width of  $\Delta E$  measured with  $D_{65}$  or A as a light source is not greater than 2.0 for said yellow heat transfer sheet supposing that  $\Delta E$  is the color difference between the color hue ( $L1*a1*b1*$ ) and the desired color hue ( $L2*a2*b2*$ ) of said image-forming layer represented by the following equation:

$$\Delta E = \{(L1* - L2*)^2 + (a1* - a2*)^2 + (b1* - b2*)^2\}^{0.5}$$

9. The multi-color image-forming material as in Claim 8, wherein  $\Delta E$  of said yellow heat transfer sheet is not greater than 5.0.

10. The multi-color image-forming material as in Claim 1, wherein the value X obtained by dividing the reflection optical density ( $OD_r$ ) of the image-forming layer constituting said yellow heat transfer sheet comprising at least one yellow organic pigment in the image-forming layer measured through a blue filter by the thickness (unit:  $\mu m$ ) of said image-forming layer is not smaller than 1.6.

11. The multi-color image-forming material as in Claim 10, wherein said value X is not smaller than 2.0.

12. The multi-color image-forming material as in Claim 1, wherein the value X obtained by dividing the reflection optical

density ( $OD_r$ ) of the image-forming layer constituting said magenta heat transfer sheet comprising at least one magenta organic pigment in the image-forming layer measured through a green filter by the thickness (unit:  $\mu\text{m}$ ) of said image-forming layer is not smaller than 1.6.

13. The multi-color image-forming material as in Claim 12, wherein said value X is not smaller than 3.0.

14. The multi-color image-forming material as in Claim 1, wherein the value X obtained by dividing the reflection optical density ( $OD_r$ ) of the image-forming layer constituting said cyan heat transfer sheet comprising at least one cyan organic pigment in the image-forming layer measured through a red filter by the thickness (unit:  $\mu\text{m}$ ) of said image-forming layer is not smaller than 2.0.

15. The multi-color image-forming material as in Claim 14, wherein said value X is not smaller than 2.9.

16. The multi-color image-forming material as in Claim 1, wherein the value X obtained by dividing the reflection optical density ( $OD_r$ ) of the image-forming layer constituting said black heat transfer sheet comprising at least one black carbon in the image-forming layer measured through a visual filter by the

thickness (unit:  $\mu\text{m}$ ) of said image-forming layer is not smaller than 2.0.

17. The multi-color image-forming material as in Claim 16, wherein said value X is not smaller than 2.7.

18. The multi-color image-forming material as in Claim 1, wherein the ratio of the optical density (OD) of the image-forming layer in said various heat-transfer sheets to the thickness of the image-forming layer is not smaller than 1.50, the recording area of multi-color image in said various heat transfer sheets has a size of 515 mm x 728 mm, the resolution of said transferred image is not smaller than 2,400 dpi, the image-forming layer in said heat transfer sheets each comprise a polymer pigment dispersant and/or phosphoric acid ester-based pigment dispersant incorporated therein, and said polymer pigment dispersant is a copolymer or polymer blend comprising  $((\text{C}_2\text{H}_5)_2\text{N}-(\text{CH}_2)_z-\text{O}-)$  (in which z represents an integer of 2 or 3), ethylene glycol and propylene glycol at a ratio of 1 : X : Y in which X and Y represent a number of from 10 to 20 and from 25 to 40, respectively.

19. The multi-color image-forming material as in Claim 1, wherein said heat transfer sheets each comprise an organic pigment and/or carbon black incorporated as a colorant in the

image-forming layer and said organic pigment and/or carbon black is monodisperse and has a particle diameter variation coefficient of not greater than 50%.

20. The multi-color image-forming material as in Claim 19, wherein said organic pigment and/or carbon black has an average particle diameter of from 50 nm to 1,000 nm.

21. The multi-color image-forming material as in Claim 1, wherein said transferred image has a resolution of not smaller than 2,400 dpi.

22. The multi-color image-forming material as in Claim 21, wherein said transferred image has a resolution of not smaller than 2,600 dpi.

23. The multi-color image-forming material as in Claim 1, wherein the image-forming layer in said various heat transfer sheets and the image-receiving layer in said image-receiving sheets each exhibit a contact angle of from  $7.0^{\circ}$  to  $120.0^{\circ}$  with respect to water.

24. The multi-color image-forming material as in Claim 1, wherein the ratio of the optical density (OD) of the image-forming layer in said various heat transfer sheets to the

thickness of the image-forming layer is not smaller than 1.80 and said image sheets each exhibit a contact angle of not more than 86° with respect to water.

25. The multi-color image-forming material as in Claim 1, wherein the recorded area of multi-color image has a size of 515 mm x 728 mm.

26. The multi-color image-forming material as in Claim 25, wherein the recorded area of multi-color image has a size of 594 mm x 841 mm.

27. The multi-color image-forming material as in Claim 1, wherein said image-forming layer comprises a pigment and an amorphous organic polymer having a softening point of from 40° to 150° incorporated therein each in an amount of from 20% to 80% by mass.

28. A multi-color image-forming process which comprises laminating an image-receiving sheet as defined in Claim 1 with each of at least four different color heat transfer sheets as defined in Claim 1 such that the image-forming layer of said heat-transfer sheet and the image-receiving layer of said image-receiving sheet are opposed to each other, irradiating the laminate with laser beam, and then transferring the laser



beam-irradiated area on the image-forming layer onto the image-receiving layer in the image-receiving sheet to effect image recording, wherein the image-forming layer on the laser beam-irradiated area is transferred to the image-receiving sheet in the form of thin film.

29. The multi-color image-forming process as in Claim 28, wherein when irradiated with laser beam, said light-to-heat conversion layer softens so that the image-forming layer on the light-to-heat conversion layer is pushed up and transferred to the image-receiving sheet in the form of thin film.

30. The multi-color image-forming process as in Claim 1, wherein the thickness of the image-forming layer in said heat transfer sheets is from 0.01  $\mu\text{m}$  to 0.9  $\mu\text{m}$ .

31. The multi-color image-forming process as in Claim 1, wherein the width of lines in laser-transferred image is from 0.8 to 1.7 times a half of the half-width (the half width at half maximum) of the distribution in the direction of subsidiary scanning of the integration of the binary energy distribution of laser beam spot in the direction of main scanning.

32. The multi-color image-forming process as in Claim 1, wherein the width of lines in laser-transferred image is from 0.8 to 1.2 times a half of the half-width (the half width at half maximum) of the distribution in the direction of subsidiary scanning of the integration of the binary energy distribution of laser beam spot in the direction of main scanning.